

Sweet, Edwards & Associates, Inc.
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Environmental Geology, Ground Water, Engineering Geology & Drilling Services

February 25, 1981

Phil Williams
Kaiser Aluminum & Chemical Corporation
Trentwood Works
P. O. Box 15108
Spokane, Washington 99215

RE: EAST LANDFILL MONITORING WELL #6

Dear Phil:

The intent of this letter is to provide details of the installation and completion of monitoring well #6. Drilling and well completion occurred between 1/26/81 and 2/3/81. As shown on the attached well log the drill encountered 36 to 40 feet of landfill waste consisting primarily of mixed sand and gravel which was slightly moist and medium grey in color. Some refractory brick and an apparent furnace bottom were also penetrated. Beneath the landfill, dry sand, gravel and boulders were encountered from 40 to 80 feet. The dry conditions of the underlying sands and gravel indicate that the overlying fill material has a somewhat higher moisture holding capacity. From 80 to 98 feet partially saturated sands and gravels were encountered. A gravelly brown clay was encountered from 98 to 100 feet and additional sands and gravels from 100 to 112 feet. When the clay was penetrated at 100 feet, the ground water level rose in the hole to 81 feet indicating that the aquifer is at least locally confined beneath the clayey lense.

During drilling, bag samples were obtained of the drill cuttings at depths shown on the attached log. A salty taste indicating the presence of precipitated chloride salts was detected on the sand and gravel samples to a minimum depth of 55 feet. The drill sample elutriates will be laboratory tested for the presence of contaminants leached from the overlying landfill.

It is our understanding that the written specifications for perforated interval were not followed by American Drilling. No perforations were made in the saturated zone above the confining clay layer. This probably explains why low chloride levels were found in the initial sampling run following well completion. Although the clay layer appears to limit downward movement of leachate, the lateral extent of the layer is not known. American

Drilling Company is scheduled to provide additional perforations as shown on the attached log followed by well developing to remove loose sediment.

In spite of unplanned delays and cost overruns on the monitoring well drilling the original goals of monitoring well placement were satisfied. The total depth of fill material is relatively shallow, 36 to 40 feet where penetrated. This shallow depth makes it unlikely that the winter or spring water table fluctuation could saturate the base of the fill. It also indicates that the primary moisture input to the landfill is from the surface which is the basis for the improved moisture routing and cover plan. In addition we now have a monitoring well which will serve as an early warning of contaminant movement and provide contaminant concentrations directly beneath the landfill.

Because of possible contaminant movement around the annulus of the well casings it may be necessary in the future to grout seal around the well casing at the depth of the confining layer. This action would guarantee against the movement of contaminants from above the clay layer to the underlying aquifer. This does not appear necessary at this time since the fill is not classified as hazardous waste. In addition, the net hydraulic gradient as evaluated during drilling is upward through the confining layer which at least seasonally restricts downward movement of contaminants.

The well head is provided with a concrete pad to promote runoff away from the well annulus and a locking lid. The well annulus is sealed with cement grout from the surface to 20 feet and with bentonite slurry from 20 feet to 54 feet. The slurry seal which is 18 feet below the bottom of fill was done at the request of Roy Anderson, Department of Ecology, to insure against contaminant migration downward through the well annulus.

Some recommended tasks to add to the existing data base are:

- 1) Survey the new monitoring well measuring point elevation.
- 2) Survey the measuring point elevation of the existing off-site well east of the east landfill and sound the well for depth.
- 3) Add this off-site existing well to the monitoring well net and

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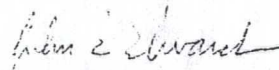
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4) Measure the depths to water in the plant wells using the existing air lines so we can estimate the radius of influence of these wells.

If you have any questions, please call.

Respectfully submitted,

SWEET, EDWARDS & ASSOCIATES, INC.



JOHN E. EDWARDS
Vice President

JEE/pks

ATTACHMENTS